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DEVELOPMENT SPECIFICATIONS

FOR

CR-17 FOUR-BAND COLLECTION RECEIVER

25X1

13 February 1959

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1. GENERAL

1.1. Purpose of this Specification

This specification stipulates the performance requirements of the CR-17 Collection Receiver and presents such electrical and mechanical design characteristics that will aid in the development and production of prototype models of such equipment.

1.2. System Description

This receiver is to be a four-band VHF receiver [redacted]

[redacted] It shall be constructed on a 3-1/2 x 19 inch relay pack type panel. All electronic circuitry in the receiver is to be transistorized, and must operate from an external 24 to 30 volt DC power source.

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1.3. Nomenclature

This collection receiver shall be identified as the CR-17.

2. QUALITY OF DESIGN AND FABRICATION

The electrical and mechanical design of the CR-17 shall be directed toward the development of a miniaturized quality product reflecting the highest possible degree of equipment reliability when exposed to the normally rough handling encountered during field usage.

2.1. JAN Specifications

The contractor shall utilize components, materials, and fabrication procedures meeting JAN Specifications of the ~~the same~~ in effect on the date of initiation of the contract.

2.1.1. JAN Specification Waiver

To accomplish the desired degree of miniaturization, the contractor may deem it necessary to utilize other than components, materials, and fabrication procedures meeting JAN Specifications. In such instances, specific waivers may be authorized by the Government, but only after review by Government engineers and prior to the submission of any prototype models.

2.1.2. Non-Fungus Nutrient Materials

All materials which are used in the CR-17 are to be non-nutrient to fungi. If after having determined that non-nutrient materials are not available other materials must be used, a waiver may be obtained as in Section 2.1.1. Any nutrient material shall be treated by a suitable fungi-resistant compound after machining, or other work, but prior to installation in any part of the CR-17.

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2.2. Environmental Conditions

2.2.1. Operating Temperatures

The design considerations of the CR-17 shall be such as to preclude malfunctioning of the equipment when exposed or storage temperatures of from -20°C to +50°C.

2.2.2. Shock and Vibration

The equipment shall be designed to withstand the rough shock and vibration normally encountered in field operation and transportation by aircraft or motor vehicles.

2.2.3. Humidity

The equipment shall be designed to withstand relative humidities up to 100% at temperatures from -20°C to +50°C including condensation due to temperature change.

3. CIRCUITRY AND DESIGN CHARACTERISTICS

3.1. General

The specific circuitry and design considerations to be employed in the development of the CR-17 shall be determined by the engineering ingenuity of the contractor and shall meet all mechanical and electrical operational characteristics noted.

3.2. Receiver Characteristics

The CR-17 shall be designed specifically to [redacted]

[redacted] The receiver shall have no provision for scanning, but instead shall continuously monitor the broad bands. Amplifiers and other circuits shall be constructed, insofar as possible, on the plug-in cards that can be easily changed to facilitate maintenance. The receiver, once adjusted for local conditions, shall be capable of unattended operation.

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3.2.1. Dimensions and Weight

The front panel shall be 17 inches wide and 7½ inches high. The depth of the receiver behind the panel, including dust cover, shall not exceed 3½ inches. ?

The unit shall be as lightweight as current packaging techniques allow, while still retaining the ruggedness to stand the shock and vibration of portable, mobile, or airborne operation.

3.2.2. Receiver Response

The receiver shall have a signal sensitivity of at least -80 dbm within the passbands specified and shall be down 40 db 1 mc outside the passbands. The passbands shall be as follows, when the receiver is operated within the environment specified:

Band one

Band two

Band three

Band four

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3.2.3. Video Output

The video amplifiers shall have an output impedance of 100 ohms.
Video bandwidth shall be 500 kc. Output: .2 volts at tangential signal.
3.5 volts peak.
No limiting below -20 dbm
input signal.

3.2.4. Audio Output

To provide for audio monitoring, the CR-17 shall also incorporate a pulse-stretched output connected to a headphone jack on the front panel. The audio output at minimum signal shall be at least 1 volt rms across a 50 ohm headphone output impedance.

3.2.5. Power Supply and Maximum Power Drain

The receiver shall operate from an external 24 to 30 volt DC power supply or battery, and shall require an operating current of no more than 200 ma.

3.2.6. Radiation

Radiation from the receiver shall be kept to an absolute minimum. MIL Specification I26600 (USAF) shall pertain where applicable. In addition, the receiver shall not generate audio noise which is audible at a distance of 10 feet in an ambient noise field of +25 db. (0 db is assumed at 0.0002 dynes/square cm.)

3.2.7. Antenna Input

The CR-17 shall utilize 1 antenna to feed the four bands. The antenna shall be supplied by the customer and shall be attached to the receiver by means of a type "N" connector. The antenna input shall have an impedance of 50 ohms.

3.2.8. Signal Operated Relay

A combining circuit and a signal operated relay shall be installed to provide control of outside equipment. When a signal is received on any one of the four channels, the combining circuit shall activate the relay. The relay must close and remain closed for the duration of the signal and for approximately two seconds thereafter. A threshold control shall be provided to adjust the sensitivity of the signal operated relay for local conditions. At maximum sensitivity, the relay shall be triggered by noise, and the threshold control shall provide for relay triggering at signal thresholds up to 0 dbm. The combining circuit shall also supply the pulse stretched output, connected to the headphone jack, providing an audio output for aural monitoring.

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3.2.9. Isolation of Video Outputs and Combining Circuit

The video output connectors shall be isolated so that possible interference from companion equipment will not trigger the signal relay.

The combining circuit must incorporate suitable electrical isolation to prevent crosstalk between the three video bands.

3.2.10. Controls

The CR-17 shall have a power ON-OFF switch, video output level control for each band, and a threshold control for the signal operated relay. All controls shall be mounted on the front panel, and all adjustable controls shall be miniature and screwdriver adjustable.

3.2.11. Connectors

All connectors shall be mounted on the front panel. All video connectors shall be of the HNC type, and the power input and signal relay contact connectors shall be Winchester "MONOBLOC" type and shall be dissimilar to prevent reversed connections. The headphone jack shall be a miniature Telex type mounted on the front panel.

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ATTACHMENT "A"

<u>DELIVERABLE ITEMS</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
Item 1	CR-17 Collection Receiver complete with essential operating accessories and comprehensive test data.	2 each
Item 2	<u>Manufacturing Drawings</u> , one set reproducible	2 each
Item 3	Operating and Maintenance Manuals	15 each
Item 4	Monthly Engineering Progress Reports	5 each month
	The contractor shall prepare and forward to the contracting agency monthly letter reports outlining principal experiments and results thereof, and including diagrams, curves, and sketches as required for clarity.	
Item Item 5	Final Engineering Report	5 each
	The final engineering report shall present a comprehensive engineering analysis of the design and development of the CR-17. The report shall also include the results of final test data.	
Item 6	Recommended Spare Parts List	2 each
	The contractor will submit a Recommended Spare Parts List, including an itemized cost breakdown of the recommended parts.	

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